

4.20 SWMU NO. 20 - MOLD FOUNDRY SETTLING CHAMBER (No photograph)

Description

This unit consisted of an aboveground concrete basin, vacuum filter, storage area, and associated pipes and equipment used for settling of Mold Foundry wastewater and sludge collection. This unit was located on a concrete pad in an open area approximately 50 feet south of the Mold Foundry Building, which is near the southeast corner of the facility property.

Aboveground and underground piping connected the basin to the Mold Foundry scrubbers and the vacuum filters. Roll-off containers were situated below the vacuum filters to collect dewatered sludge. Aboveground and underground piping was used to continuously recycle wastewater to the Mold Foundry scrubber or to discharge blowdown to the West Surface Impoundment (SWMU No. 27). No secondary containment was provided for liquid releases from this unit.

Status

This unit operated until 1984, when the Armco facility closed. It was not RCRA-regulated under interim status.

Waste Type

This unit received wastewater that contained Mold Foundry sand (i.e., Mold Foundry crusher solids and wet scrubber sludge) and mold "blackening," a material to prevent metals from sticking to molds. EP Toxicity tests found detectable quantities of arsenic, barium, lead, and selenium in the Mold Foundry wet scrubber sludge and Mold Foundry crusher solids (ERM-Southwest, Inc., 1984).

Waste Management

Wastewater from the Mold Foundry was transferred to the settling basin through aboveground and underground piping. Mold Foundry sand that settled to the bottom of the settling basin was raked to vacuum filters and dewatered. Roll-off containers situated under the vacuum filters were used to collect the dewatered sand. The Mold Foundry sand was hauled off site by a disposal contractor or transferred to the East End Surface Impoundment (SWMU No. 21) by truck.

Wastewater was recycled through aboveground and underground piping to the Mold Foundry scrubbers until it could no longer be reused. The blowdown was then discharged to the Houston Ship Channel through NPDES-permitted Outfall 015.

Environmental Releases

There have been no documented or reported releases from this unit. However, since the units were dismantled, it was not possible to assess the integrity of the units during the VSI.

Remedial Action Taken

This unit was dismantled and removed after closure of the Armco facility.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

This unit managed waste in open areas with no secondary containment for liquid releases. The integrity of the units and associated equipment could not be assessed because they have been removed from the site.

4.21 SWMU NO. 21 - EAST END SURFACE IMPOUNDMENT (Photograph 12)

Description

This unit is a filled and capped surface impoundment that originally measured approximately 100 feet by 60 feet by nine feet deep. At closure, the unit contained approximately 2,000-cubic yards of waste from the Rolling Mill and Mold Foundry; the unit had approximately six feet of freeboard. It was clay-lined and constructed of earthen materials. (ERM-Southwest, Inc., 1984)

The unit is located in the southeast corner of the site, west of the East Acid Surface Impoundment (SWMU No. 22). It is situated in an area that serves as a stormwater runoff ditch for the Armco/Greensport Industrial Park facility, and the back side of the surface impoundment has become part of the ditch wall. The unit was less than 30 feet from the shallowest aquifer (ERM-Southwest, Inc., 1984).

It was closed in 1980, capped and backfilled with local soils, with wastes in place. During the VSI conducted on August 30 - September 1, 1993, dense vegetation, including shrubs and small trees, was observed on the cap of the unit, which is approximately six feet below grade.

Status

This unit operated from 1976 until early 1980. It was closed in 1980 and was not RCRA-regulated under interim status.

Waste Type

This unit temporarily stored wastes from the Mold Foundry Settling Chamber (SWMU No. 20), particularly Mold Foundry sand (i.e., mold foundry crusher solids, mold foundry wet scrubber sludge, and mold "blackening," a material to prevent metals from sticking to molds).

This unit also sometimes temporarily stored mill scale from the Central Rolling Mills prior to transfer to the Ore Bedding Area (SWMU No. 7). Based on available data, mill scale is made up of 70 - 75 percent iron and consists of ferrous oxide (FeO) and ferric oxide (Fe₂O₃) and is typically contaminated with oil and grease as a result of oil conditioning, oil spills, line ruptures, and excessive dripping of lubricants (U.S. EPA, 1982d).

At closure in 1984, approximately 2,000 cubic yards of waste was disposed at this unit (ERM-Southwest, Inc., 1984).

Waste Management

This unit temporarily stored miscellaneous waste from the Mold Foundry Settling Chamber (SWMU No. 20) if a disposal contractor was not available to pick up the waste. It was transferred from the Mold Foundry Settling Chamber by a front-end loader or rail car. Waste from the Central Rolling Mills, which collected at the Central Mill System Scale Basin (SWMU No. 23), was also sometimes temporarily stored at this unit until it could be accepted by the Ore Bedding Area (SWMU No. 7).

Discharge from the surface impoundment ran to NPDES-permitted Outfall No. 011.

Environmental Releases

Since this unit was a clay-lined surface impoundment constructed of earthen materials, waste is likely to have come into direct contact with the soil; due to proximity of the shallowest aquifer (less than 30 feet), waste could migrate to the ground water (ERM-Southwest, Inc., 1984). Measurements conducted at closure on the soil borings in the area detected near neutral conditions with pH ranging from 5.9 to 7.9. EP tests found detectable quantities of arsenic, barium, lead, and selenium in the Mold Foundry wet scrubber sludge and Mold Foundry crusher solids disposed at the site. The concentrations of these metals, however, were determined to be below National Interim Primary Drinking Water Standards (NIPDWS), and no further action was recommended at closure. (ERM-Southwest, Inc., 1984)

There were no signs of contamination observed during the VSI on August 30 - September 1, 1993. Thick grass and small trees covered the cap of the unit. However, since the unit has been closed, it was not possible to assess its operating condition during the VSI.

Remedial Action Taken

The site was backfilled with natural soils in 1980, after the unit ceased receiving waste.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since this unit was a clay-lined surface impoundment constructed of earthen materials, waste is likely to have come into direct contact with the soil. Because ground water at the site is less than 30 feet from the ground surface, ground water may also have been contaminated by waste in the unit. While EP tests indicated that metals concentrations were below NIPDWS limits, these tests did not indicate that contaminant concentrations in the soil had been reduced to background levels.

4.22 SWMU NO. 22 - EAST ACID SURFACE IMPOUNDMENT (Photographs 13 and 14)

Description

This unit is a filled and capped surface impoundment that originally measured approximately 400 feet by 100 feet by 15 feet deep. When it was in operation, it

contained approximately 22,000-cubic yards of waste; the unit had approximately 10 feet of freeboard. It was clay-lined and constructed of earthen materials. The unit was designed as a disposal site for spent pickle liquor, Coke Plant acid waste, and tar decanter sludge (ERM-Southwest, Inc., 1984).

The unit is located at the southeast end of the facility property, northeast of the East End Surface Impoundment (SWMU No. 21) and northeast of the Coke Plant.

At closure, the site was filled with rubble, lime, and other miscellaneous fill and was covered by a clay cap that is approximately five feet above grade. During the VSI conducted on August 30 - September 1, 1993, the cap was well-vegetated, but the vegetation along the western edge of the cap was discolored. The eastern portion of the unit, however, was covered with healthy-looking vegetation.

Status

This unit operated from 1954 until 1973, when it was closed. It was not RCRA-regulated under interim status.

Waste Type

This unit received the following wastes:

- Tar decanter sludge (K087), which contained phenol and naphthalene; and
- Spent pickle liquor (K062), which contained hexavalent chromium and lead.

Waste received by this unit were RCRA characteristic for corrosivity and toxicity. (ERM-Southwest, Inc., 1984)

Waste Management

This unit received tar decanter sludge from the Coke Plant prior to use of the Coke Plant Tar Decanter System (SWMU No. 1). Tar sludge was transferred through the use of a slag thimble, which is an open-topped, funnel-like container. The thimble held 250 cubic feet of waste and was filled at the Coke Plant, moved to this unit by a tractor vehicle, and tipped to empty the waste into the unit. The impoundment also received spent pickle liquor prior to use of the Coke Plant Incinerator (SWMU No. 6).

Environmental Releases

In late 1980 and early 1981, a hydrogeologic investigation by ERM-Southwest indicated that acidic waste had migrated laterally and vertically from the unit. During subsequent investigations, eight ground-water monitoring wells were drilled; three of these wells measured ground water with a pH between 2.2 and 3.8. TOC levels measured at the wells ranged from 94 mg/l to 3,900 mg/l; phenol concentrations varied from less than 0.005 mg/l to 14 mg/l; lead concentrations varied from 0.1 mg/l to 1 mg/l. ERM-Southwest determined that the potential for endangering downgradient water users does not exist because there is no downgradient use of ground water from the shallow sands underneath the unit. However, ground water does migrate to surface water. (ERM-Southwest, Inc., 1984)

During the VSI on August 30 - September 1, 1993, the discolored vegetation along the western edge of the cap of this unit may have been stressed. However, since the unit has been closed and capped, it was not possible to assess its integrity during the VSI.

Remedial Action Taken

At closure in 1973, the unit ceased receiving waste and was filled. The fill consisted of 1,800 tons of cement flue dust and lime mixed with the acidic material contained in the unit. A compacted, three- to six-foot thick clay cap was placed on the unit in 1982.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since this unit was a clay-lined surface impoundment constructed of earthen materials, waste is likely to have come into direct contact with the soil. Ground-water sampling has indicated that localized contamination has occurred. Hydrogeologic records show that ground water migrates to surface water in this area. In addition, the integrity of this unit could not be assessed because it has been filled and capped. (ERM-Southwest, Inc., 1984)

4.23 SWMU NO. 23 - CENTRAL MILL SYSTEM SCALE BASIN (No photograph)

Description

This unit consisted of an aboveground, concrete settling basin for process wastewater from the Central Rolling Mills. The basin measured approximately 250 feet by 125 feet. The unit consisted of two chambers that were separated by a weir. The first chamber was a hot well-deep receiving basin where settling of solids began. The second chamber was for secondary settling.

The unit was located near the center of the mill, west of the D&L Quality Painting operations (SWMU Nos. 35 - 38) and south of the Central Furnace System Cooling Tower and Basin (SWMU No. 24). It was outside and situated on a concrete pad. No secondary containment was provided for liquid releases and the unit operated continuously, discharging to the West Surface Impoundment (SWMU No. 27) via the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25).

The unit was dismantled when Armco ceased operations. At the time of the VSI conducted on August 30 - September 1, 1993, the site consisted of an open area of dirt and gravel.

Status

This unit operated from 1942 until the early 1980s. It was not RCRA-regulated under interim status.

Waste Type

This unit received process wastewater from the Central Rolling Mills. This wastewater likely contained mill scale, oil, grease, and toxic metal pollutants. Based on available data, mill scale is made up of 70 - 75 percent iron and consists of ferrous oxide (FeO) and ferric oxide (Fe₂O₃) and is typically contaminated with oil and grease as a result of oil conditioning, oil spills, line ruptures, and excessive dripping of lubricants (U.S. EPA, 1982d).

Toxic metal pollutants, such as chromium, copper, lead, nickel, and zinc are typically found in wastewaters from rolling mills. These constituents result from the use of these metals in steel making and alloying and possibly from lubricants used at certain mills. (U.S. EPA, 1982d)

Waste Management

Wastewater was pumped through dedicated aboveground and underground piping to the first chamber of the unit, a hot well-deep receiving basin where settling of solids began. Some wastewater was pumped from this chamber through piping to the Central Rolling Mills for reuse, while the excess wastewater was pumped to the second chamber for further settling. According to facility representatives, approximately 12,000 to 15,000 gallons per minute of wastewater was received by this unit from steel-making operations in the Central Rolling Mills. Vacuum filters were used to dewater sludge that settled to the bottom of the basin. Solids were collected into roll-off containers located below the basin and periodically transferred by truck to the Ore Bedding Area (SWMU No. 7) or the East End Surface Impoundment (SWMU No. 21). The wastewater was discharged to the West Surface Impoundment (SWMU No. 27) via the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25).

Environmental Releases

There have been no documented or reported releases from this unit.

Remedial Action Taken

The unit was dismantled and removed from the site in the early 1980s.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

This unit managed waste in an open area without secondary containment. The integrity of this unit could not be assessed because it has been dismantled and removed from the site.

4.24 SWMU NO. 24 - CENTRAL FURNACE SYSTEM COOLING TOWER AND BASIN (No photograph)

Description

This unit consisted of a cooling tower used to cool non-contact cooling water from the central furnace system. Blowdown was occasionally generated at the cooling tower and settled in a concrete basin.

The unit was located north of the Central Mill System Scale Basin (SWMU No. 23) in the central part of the site. The basin was situated on a concrete pad, with no secondary containment for liquid releases. It operated continuously, discharging to the West Surface Impoundment (SWMU No. 27), via the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25).

The unit was dismantled when Armco ceased operations. During the VSI conducted August 30 - September 1, 1993, the area that contained the unit was an open area of dirt and gravel.

Status

This unit operated from 1942 until 1984, when the Armco facility ceased operations. It was not RCRA-regulated under interim status.

Waste Type

The cooling tower and basin handled non-contact cooling tower blowdown, which contained descaling agents.

Waste Management

Blowdown was pumped from the cooling tower into a concrete basin. The wastewater was discharged to the West Surface Impoundment (SWMU No. 27) via the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25).

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

The cooling tower and basin were dismantled after the Armco facility ceased operations.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

According to facility representatives, this unit was used solely to manage non-contact cooling water used in the Central Furnace System.

4.25 SWMU NO. 25 - DITCHES AND PUMPING BASIN FOR THE WEST SURFACE IMPOUNDMENT (No photograph)

Description

This unit originally consisted of unlined, earthen drainage ditches and embankments, concrete and metal pipes, and a pumping basin used to transfer process wastewaters and stormwater runoff to the West Surface Impoundment (SWMU No. 27). An eastern and a western ditch transferred wastewater from the Central Mill System Scale Basin (SWMU No. 23), the Central Furnace System Cooling Tower and Basin (SWMU No. 24), and the Rinse Tank for Wire Mill Cleaning (SWMU No. 19). The ditches carried wastewater to an above-grade concrete pumping basin, which measured approximately 50 feet by 30 feet by 20 feet deep. The basin had vertical pumps and aboveground and underground piping to pump collected wastewater and stormwater runoff into the West Surface Impoundment after large debris and oil were removed from the surface of the wastewater that collected in the basin. The Used Oil Storage Tank (SWMU No. 26) was located adjacent to the basin and was used to store collected oil that was skimmed from the surface of the wastewater.

The eastern section of the ditches ran from the Central Mill System Scale Basin and the Central Furnace System Cooling Tower and Basin in the central part of the site, south past the area currently containing the Stolt-Nielsen Wastewater Tanks (SWMU No. 43). The western section of the ditches ran between the Rod Mill and the Electric Furnace Shop No. 2, south past the Bar Storage Buildings to the pumping basin. The concrete basin was located approximately 300 feet southeast of the east end of the West Surface Impoundment. No secondary containment for provided for liquid releases.

This unit was less than 30 feet from the shallowest aquifer (ERM-Southwest, Inc., 1984). The ditches have been sealed and the basin has been dismantled and removed from the site. During the VSI conducted August 30 - September 1, 1993, the area of the basin was covered with thick grass.

Status

These ditches and pumping basin were used from 1965 until 1984, during operation of the West Surface Impoundment. They were not RCRA-regulated under interim status.

Waste Type

The ditches transferred process wastewater generated during various processes. Types and sources of waste received by this unit include the following:

- Industrial process wastewaters from the Central Rolling Mills, which was the unit's primary wastestream. This cooling water, which was generated when hot steel off the mill stands was sprayed with water, is likely to have contained mill scale, oils, greases, and toxic metals. Based on available

data, mill scale is made up of 70 - 75 percent iron and consists of ferrous oxide (FeO) and ferric oxide (Fe₂O₃) and is typically contaminated with oil and grease as a result of oil conditioning, oil spills, line ruptures, and excessive dripping of lubricants. Toxic metal pollutants, such as chromium, copper, lead, nickel, and zinc, also are typically found in wastewaters from rolling mills. These constituents result from the use of these metals in steel making and alloying and possibly from lubricants used at certain mills. (U.S. EPA, 1982d)

- Non-contact cooling tower blowdown from the Central Furnace System Cooling Tower and Basin;
- Rinsate water from the Rinse Tank for Wire Mill Cleaning (SWMU No. 19), which was contaminated with spent pickle liquor solution (K062). This waste contained sulfuric acid, chromium, lead, and solvents (F001 and F005) (Armco, Inc., 1983) and was RCRA characteristic for corrosivity and toxicity. Based on available data, spent pickle liquor typically has a pH of less than one and contains high concentrations of toxic metals, including dissolved iron, arsenic, cadmium, chromium, copper, lead, nickel, and zinc (The World Bank, 1983);
- Discharge from the Rod Mill Surface Impoundments (SWMU Nos. 28 and 29), containing mill scale, oil, and grease; and
- Stormwater runoff.

Waste Management

Industrial process wastewater from the Central Mill System Scale Basin (SWMU No. 23), non-contact cooling water from the Central Furnace System Cooling Tower and Basin (SWMU No. 24), rinsate acid solution from the Rinse Tank for Wire Mill Cleaning (SWMU No. 19), discharge from the Rod Mill Surface Impoundments (SWMU Nos. 28 and 29), and stormwater were discharged to the ditches, which transferred the wastewater through culverts, embankments, and pipes to the Pumping Basin. In the basin, large debris was removed and floating oil was collected by skimmers that transferred oil to the Used Oil Storage Tank (SWMU No. 26). Wastewater was pumped via vertical pumps to the West Surface Impoundment (SWMU No. 27).

Environmental Releases

Since the ditches were unlined and constructed of earthen materials, waste came into direct contact with the soil; due to proximity of the shallowest aquifer (less than 30 feet), waste could migrate to the ground water (ERM-Southwest, Inc., 1984).

Remedial Action Taken

At closure of the Armco facility in 1984, all culverts, drain lines, and overflow lines entering the basin and the West Surface Impoundment were grouted or filled with compacted clay to seal them off. Armco also arranged for the demolition and removal of the pump basin.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since the ditches were unlined earthen culverts, waste is likely to have come into direct contact with the soil; due to proximity of the shallowest aquifer, waste is likely to migrate to the ground water. In addition, since the pumping basin has been demolished and removed from the site, it was not possible to assess the integrity of this unit.

4.26 SWMU NO. 26 - USED OIL STORAGE TANK (No photograph)

Description

This unit was a 10,000-gallon, aboveground, carbon steel tank used to receive used oil that was collected by oil skimmers in the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25). The oil was sold to various oil companies, which transferred the oil by truck to refineries for recycling.

The tank was located adjacent to the basin, approximately 300 feet southeast of the east end of the West Surface Impoundment (SWMU No. 27). It was situated on a concrete pad, with no secondary containment for liquid releases.

At closure of the facility, the tank was dismantled and removed from the site. During the VSI conducted August 30 - September 1, 1993, the area was covered with thick grass.

Status

This unit was in operation from 1965 until 1984, when the Armco facility ceased operations. It was not RCRA-regulated under interim status.

Waste Type

This unit received used oil removed from process wastewater. The used oil may have contained concentrations of cadmium, chromium, lead, arsenic, and organic halogens, and had the RCRA hazardous characteristic for ignitability. Used oils also may contain benzene, toluene, xylene, ethyl benzene, naphthalene, and phenanthrene.

Waste Management

Used oil collected by oil skimmers in the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25) was received by this unit. Within 90 days, the used oil was transported off site by various waste oil recyclers.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

This tank was removed from the Armco site in 1984, when operations ceased.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

This unit managed waste in an open area without secondary containment for liquid releases. The integrity of this unit could not be assessed because it has been dismantled and removed from the site.

4.27 SWMU NO. 27 - WEST SURFACE IMPOUNDMENT (Photographs 15 and 16)

Description

This unit is a filled and capped, clay-lined, earthen surface impoundment that served as the main process wastewater collection and settling pond. According to facility representatives, the unit measured approximately 1,200 feet by 50 feet and held approximately 10 million gallons of wastewater. During operations, it received wastewaters from various primary and secondary settling basins and skimming pits. It was used primarily for solids settling of various wastewater streams, particularly Rolling Mill cooling water (ERM-Southwest, Inc., 1984). The Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25) served as a conduit for transferring wastewater to this unit. Waste was also received directly from several processes via aboveground and underground piping. During closure of the Armco facility, this unit received waste from various units that were being closed and dismantled. It was closed in 1986 with the waste left in place.

The unit covered 2.5 acres in the southern area of the site, north of the Ore Bedding Area (SWMU No. 7) and south of the Construction Rubble Waste Pile (SWMU No. 30). The unit was less than 30 feet from the shallowest aquifer (ERM-Southwest, Inc., 1984).

During the VSI conducted on August 30 - September 1, 1993, there were no signs of contamination at the site of the impoundment. The cap was approximately three feet above grade and was covered with thick grass.

Status

This unit was used during facility operations from 1965 until 1984. During closure activities from 1984 until 1986, it received waste from the Blast Furnace Sludge Waste Pile (SWMU No. 8), the North Rod Mill Surface Impoundment (SWMU 28), and the Construction Rubble Waste Pile (SWMU No. 30). The unit was capped and closed in 1986 with waste in place. It was certified closed for TWC in 1986 and was not RCRA-regulated under interim status.

Waste Type

Until 1984, this unit received mill scale and wastewater generated in production areas throughout the facility, along with small quantities of other wastes. Types and sources of waste received by this unit via the Ditches and Pumping Basin for the West Surface Impoundment (SWMU No. 25) include the following:

- Industrial process wastewaters from the Central Rolling Mills. This cooling water, which was the unit's primary wastestream, was generated when hot steel off the mill stands was sprayed with water. This wastewater contained mill scale, oils, greases, and toxic metals. Based on available data, mill scale is made up of 70 - 75 percent iron and consists of ferrous oxide (FeO) and ferric oxide (Fe₂O₃) and is typically contaminated with oil and grease as a result of oil conditioning, oil spills, line ruptures, and excessive dripping of lubricants. Toxic metal pollutants, such as chromium, copper, lead, nickel, and zinc are typically found in wastewaters from rolling mills. These constituents result from the use of these metals in steel making and alloying and possibly from lubricants used at certain mills. (U.S. EPA, 1982d)
- Non-contact cooling tower blowdown from the Central Furnace System Cooling Tower and Basin (SWMU No. 24).
- Rinsate water from the Rinse Tank for Wire Mill Cleaning (SWMU No. 19), which was contaminated with spent pickle liquor solution (K062). This waste contained sulfuric acid, chromium, lead, and solvents (F001 and F005) (Armco, Inc., 1983) and was RCRA characteristic for corrosivity and toxicity. Based on available data, spent pickle liquor typically has a pH of less than one and contains high concentrations of toxic metals, including dissolved iron, arsenic, cadmium, chromium, copper, lead, nickel, and zinc (The World Bank, 1983);
- Discharge from the North and South Rod Mill Surface Impoundments (SWMU Nos. 28 and 29) containing mill scale, oil, and grease; and
- Stormwater runoff.

Waste also was received directly through aboveground and underground piping from the Electric Furnace Shop No. 1 Clarifier (SWMU No. 13). When the plant ceased operations in 1984, there were approximately 58,000 cubic yards of sludge contained in this unit, which remained in place.

After the facility ceased operations in 1984, the unit received waste of various types from other SWMUs at the facility as these units were closed and excavated. Wastes that were received by this unit and the sources of these wastes are described below:

- Approximately 20,000 cubic yards of dredgings from the Houston Ship Channel, generated during Armco's dock improvement project (ERM-Southwest, Inc., 1984);

- Miscellaneous waste that had collected in the Construction Rubble Waste Pile (SWMU No. 30), including rock, brick, concrete, steel, wood, rubber, and paper;
- Blast Furnace sludge containing iron ore, coke, and limestone that had accumulated at the Blast Furnace Sludge Waste Pile (SWMU No. 8). Blast Furnace sludge EP toxicity data indicate that this sludge contained detectable concentrations of arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, fluoride, and nitrate. Of these, lead levels (measured at levels ranging from 0.28 to 0.4 mg/l) and cadmium levels (ranging from 0.023 to 0.116 mg/l) have been regularly found in concentrations above the National Interim Primary Drinking Water Standards (NIPDWS) limits. This sludge also was found to leach (in distilled water) concentrations of lead, mercury, and fluoride that exceeded NIPDWS levels (ERM-Southwest, Inc., 1985); and
- Approximately 4,700 cubic yards of waste from the North Rod Mill Surface Impoundment (SWMU No. 28) (ERM-Southwest, Inc., 1984), which contained mill scale, oil, and grease.

EP tests conducted by Engineering-Science during a RCRA §3012 site inspection indicated that liquid waste in the unit had detectable concentrations of barium (2.6 mg/l), lead (0.1 mg/l), and selenium (0.02 mg/l), with total organic carbon of 14.8 percent. These RCRA toxic metals are all above NIPDWS limits. (ERM-Southwest, Inc., 1984)

Sludge samples taken by ERM-Southwest after placement of channel dredgings in the unit found detectable concentrations of arsenic, barium, cadmium, chromium, lead, silver, nitrate, and fluoride in the unit. With the exception of fluoride, which was found at a concentration of 5.35 mg/l, all of these elements had concentrations below NIPDWS limits. These samples contained over eight percent oil and grease and 17 percent TOC by dry weight. (ERM-Southwest, Inc., 1984)

Waste Management

During operations at the Armco facility, this unit received mill scale waste and industrial process wastewater generated throughout the facility. All wastewater received had already undergone primary settling in clarifier units, rinse tanks, and scale basins. Wastewater was received directly by this unit via aboveground and underground piping from the Electric Furnace Shop No. 1 Clarifier (SWMU No. 12). Wastewater received via the Ditches and Pumping basin for the West Surface Impoundment (SWMU No. 25) included waste from the Central Mill System Scale Basin (SWMU No. 23), the Central Furnace System Cooling Tower and Basin (SWMU No. 24), the Rinse Tank for Wire Mill Cleaning (SWMU No. 19), and the North and South Rod Mill Surface Impoundments (SWMU Nos. 28 and 29).

This waste was allowed to settle, aerate, and cool in the unit before being pumped through aboveground and underground piping to the Electric Furnace Shop No. 2 for reuse as make-up water. Excess wastewater was discharged through NPDES-permitted Outfall No. 001.

After 1975, the unit was dredged and an unknown quantity of sludge was transferred to the South Rod Mill Surface Impoundment (ERM-Southwest, Inc., 1985).

Upon closure of the Armco facility in the early 1980s, this unit was drained and all liquid waste was discharged through Outfall No. 001. Approximately 10,200 cubic yards of mill scale waste was dredged from this unit and transferred to the South Rod Mill Surface Impoundment to fill up available space. After dredging, the West Surface Impoundment was used for disposal of miscellaneous wastes that were excavated from closing units. These wastes included 4,700 cubic yards of mill scale waste from the North Rod Mill Surface Impoundment, waste and debris from the Construction Rubble Waste Pile (SWMU No. 30), waste from the Blast Furnace Sludge Waste Pile (SWMU No. 8), and dredging from the Houston Ship Channel. These wastes were left in place and capped. (ERM-Southwest, Inc., 1984)

Environmental Releases

Since this unit was a clay-lined surface impoundment constructed of earthen materials, waste is likely to have come into direct contact with the soil; due to proximity of the shallowest aquifer (less than 30 feet), waste could migrate to the ground water (ERM-Southwest, Inc., 1984).

There were no signs of contamination observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

TWC approved the closure plan for this unit on December 12, 1985. As part of closure, this unit was capped with three feet of recompacted clay and one foot of topsoil (ERM-Southwest, Inc., 1984). This unit was certified closed for TWC in 1986. Sludge samples were taken on at least three occasions in 1984 (see Waste Type and Environmental Releases sections above). No waste removal has taken place.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since this unit was a clay-lined surface impoundment, waste is likely to have come into contact with the soil; due to proximity of the shallowest aquifer (less than 30 feet), waste could migrate to the ground water. Sludge sampling indicated that certain metals concentrations were above NIPDWS limits (ERM-Southwest, Inc., 1984). Sampling was not conducted to demonstrate that soil and ground-water contamination had been reduced to background levels at closure.

4.28 SWMU NO. 28 - NORTH ROD MILL SURFACE IMPOUNDMENT (Photographs 17 and 18)

Description

This unit is a filled and capped surface impoundment used as a collection and settling pond for cooling water from the Rod Mill. It consisted of the northern portion of an 8.7 million-gallon horseshoe-shaped surface impoundment. In 1975, Armco constructed a dike that divided the Rod Mill Surface Impoundment into this unit and the South Rod Mill Surface Impoundment (SWMU No. 29).

The unit was located to the east of the Central Rolling Mills, south of the Open Hearth Container Storage Area (SWMU No. 32) near the eastern portion of the Armco facility. The unit was less than 30 feet from the shallowest aquifer (ERM-Southwest, Inc., 1984).

During the VSI conducted on August 30 - September 1, 1993, this unit was capped and covered by thick grass, and there were no visible signs of contamination.

Status

This unit operated from 1945 until 1970, when the Rod Mill ceased operations. It was certified closed for TWC in 1986. It was not RCRA-regulated under interim status.

Waste Type

This unit and the South Rod Mill Surface Impoundment received cooling water from the Rod Mill, which contained mill scale, oil, grease, and toxic metals generated during cooling of hot steel rods. Based on available data, mill scale is made up of 70 - 75 percent iron and consists of ferrous oxide (FeO) and ferric oxide (Fe₂O₃) and is typically contaminated with oil and grease as a result of oil conditioning, oil spills, line ruptures, and excessive dripping of lubricants. Toxic metal pollutants, such as chromium, copper, lead, nickel, and zinc are typically found in wastewaters from rolling mills. These constituents result from the use of these metals in steel making and alloying and possibly from lubricants used at certain mills. (U.S. EPA, 1982d)

EP tests conducted by Engineering-Science during a RCRA §3012 site inspection indicated that liquid waste in the Rod Mill Surface Impoundments had detectable concentrations of cadmium (0.02 mg/l) and lead (0.1 mg/l). This lead concentration is above NIPDWS limits. (Engineering-Science, Inc., 1984)

Analytical results of composite sludge samples taken by ERM-Southwest in this unit showed detectable concentrations of arsenic, barium, chromium, silver, nitrate-N, and fluoride. With the exception of fluoride, which had a concentration of 2.78 mg/l, these concentrations were all below NIPDWS limits. (ERM-Southwest, Inc., 1984)

Waste Management

From 1945 until 1970, cooling water from the Rod Mill was transferred to this unit and the South Rod Mill Surface Impoundment (SWMU No. 29) through dedicated piping. Mill scale, oil, and grease were allowed to settle out of the cooling water, and the residual wastewater was recycled back to the Rod Mill stands.

At closure of the Armco facility, this unit contained 6,500 cubic yards of waste. Approximately 1,800 cubic yards of this waste were excavated and transferred to the South Rod Mill Surface Impoundment to fill up that unit. The remaining 4,700 cubic yards of waste were transferred to the West Surface Impoundment (SWMU No. 27) for disposal.

Environmental Releases

Ground-water monitoring around the North and South Rod Mill Surface Impoundments indicated that elevated lead levels of between 0.16 and 0.19 mg/l were present downgradient of the units, which are substantially greater than the NIPDWS limit

of 0.05. By comparison, a monitoring well drilled upgradient of the units recorded a lead concentration of 0.08 mg/l. Cadmium concentrations ranged from 0.01 mg/l to 0.03 mg/l downgradient, which is at and slightly above NIPDWS levels. (ERM-Southwest, Inc., 1984)

Remedial Action Taken

TWC approved the closure plan for this unit on December 12, 1985. This unit was capped and certified closed for TWC in 1986.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since this unit was a clay-lined surface impoundment constructed of earthen materials, waste is likely to have come into direct contact with the soil; due to proximity of the shallowest aquifer (less than 30 feet), waste could migrate to the ground water (ERM-Southwest, Inc., 1984). Sludge samples failed the EP toxicity test and TDWR leachate test for fluoride. Closure sampling indicated that there were high levels of cadmium and lead in the ground water. (ERM-Southwest, Inc., 1984)

4.29 SWMU NO. 29 - SOUTH ROD MILL SURFACE IMPOUNDMENT (Photographs 17 and 18)

Description

This unit is a filled and capped surface impoundment used as a collection and settling pond for cooling water from the Rod Mill. It consisted of the southern portion of an 8.7 million-gallon horseshoe-shaped surface impoundment. In 1975, Armco constructed a dike that divided the Rod Mill Surface Impoundment into this unit and the North Rod Mill Surface Impoundment (SWMU No. 28). After separation, this unit was used to dispose of dredging from the West Surface Impoundment (SWMU No. 27).

The unit was located to the east of the Central Rolling Mills, south of the Open Hearth Container Storage Area (SWMU No. 32), near the eastern portion of the Armco facility. The unit was less than 30 feet from the shallowest aquifer (ERM-Southwest, Inc., 1984).

During the VSI conducted on August 30 - September 1, 1993, the site of this unit was capped and covered by thick grass, and there were no visible signs of contamination.

Status

This unit operated from 1945 until 1970, when the Rod Mill ceased operations. This unit was certified closed for TWC in 1986. It was not RCRA-regulated under interim status.

Waste Type

From 1945 until 1970, this unit and the North Rod Mill Surface Impoundment received cooling water from the Rod Mill, which contained mill scale, oil, grease, and toxic metals generated during cooling of hot steel rods. This waste made up the lower layer of sludge contained in the unit at closure. Based on available data, mill scale is made up of 70 - 75 percent iron and consists of ferrous oxide (FeO) and ferric oxide (Fe₂O₃) and is typically contaminated with oil and grease as a result of oil conditioning, oil spills, line ruptures, and excessive dripping of lubricants. Toxic metal pollutants, such as chromium, copper, lead, nickel, and zinc are typically found in wastewaters from rolling mills. These constituents result from the use of these metals in steel making and alloying and possibly from lubricants used at certain mills. (U.S. EPA, 1982d)

After 1975, sludge that was dredged from the West Surface Impoundment was transferred to this unit (ERM-Southwest, Inc., 1984). This waste, which made up the majority of the waste contained in this unit, represented the upper layer of sludge at closure. EP tests conducted at the West Surface Impoundment by Engineering-Science during a RCRA §3012 site inspection indicated that liquid waste in the unit had detectable concentrations of barium (2.6 mg/l), lead (0.1 mg/l), and selenium (0.02 mg/l), with total organic carbon of 14.8 percent. These RCRA toxic metals are all above NIPDWS limits. (Engineering-Science, Inc., 1984)

Sludge samples taken at the West Surface Impoundment by ERM-Southwest after placement of channel dredgings in the unit found detectable concentrations of arsenic, barium, cadmium, chromium, lead, silver, nitrate, and fluoride in the unit. With the exception of fluoride, which was found at a concentration of 5.35 mg/l, all of these elements had concentrations below NIPDWS limits. These samples contained over eight percent oil and grease and 17 percent TOC by dry weight. (ERM-Southwest, Inc., 1984)

During closure of the Armco facility in 1984, 10,200 cubic yards of mill scale waste from the West Surface Impoundment and 1,800 cubic yards of mill scale waste from the North Rod Mill Surface Impoundment was transferred to this unit. (ERM-Southwest, Inc., 1984)

Waste Management

From 1945 until 1970, cooling water from the Rod Mill was transferred to this unit through dedicated piping. Mill scale, oil, and grease were allowed to settle out of the cooling water, and the residual wastewater was recycled back to the Rod Mill stands.

After 1975, this unit received portions of the sludge that had collected in the West Surface Impoundment (SWMU No. 27) (ERM-Southwest, Inc., 1984). As part of facility closure in 1984, 1,800 cubic yards of mill scale waste from the North Rod Mill Surface Impoundment (SWMU No. 28) and 10,200 cubic yards of mill scale waste from the West Surface Impoundment (SWMU No. 27) were transferred to this unit to fill up available space (ERM-Southwest, Inc., 1984).

Environmental Releases

Waste in this unit contained significant levels of lead (0.193 mg/l), iron (0.313 mg/l), zinc (5.12 mg/l), and magnesium (7.46 mg/l) (ERM-Southwest, Inc., 1985). Ground-water monitoring around the North and South Rod Mill Surface Impoundments

indicated that elevated lead levels of between 0.16 and 0.19 mg/l were present downgradient of the units, which are substantially greater than the NIPDWS limit of 0.05. By comparison, a monitoring well drilled upgradient of the units recorded a lead concentration of 0.08 mg/l. Cadmium concentrations ranged from 0.01 mg/l to 0.03 mg/l downgradient, which is at and slightly above NIPDWS levels. (ERM-Southwest, Inc., 1984)

Remedial Action Taken

As part of facility closure, 1,800 cubic yards of mill scale waste from the North Rod Mill Surface Impoundment and 10,200 cubic yards of mill scale waste from the West Surface Impoundment were transferred to this unit to fill up available space. This waste was left in place in this unit, and stiff clay berms from the North Rod Mill Surface Impoundment were used to place a one-foot recompacted clay cap over the unit (ERM-Southwest, Inc., 1984). The clay cap was covered with one foot of top soil.

TWC approved the closure plan for this unit on December 12, 1985. This unit was certified closed for TWC in 1986.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since this unit was a clay-lined surface impoundment constructed of earthen materials, waste is likely to have come into direct contact with the soil; due to proximity of the shallowest aquifer (less than 30 feet), waste could migrate to the ground water (ERM-Southwest, Inc., 1984). Sludge samples failed the EP toxicity test and TDWR leachate test for fluoride. Closure sampling indicated that there were high levels of cadmium and lead in the ground water.

4.30 SWMU NO. 30 - CONSTRUCTION RUBBLE WASTE PILE (Photographs 19 and 20)

Description

This unit is a former waste pile that collected approximately 22,000 cubic yards of construction rubble during operations.

It was located north of the West Surface Impoundment (SWMU No. 27) in the southern end of the site.

Grass covered the area of the former unit during the VSI conducted August 30 - September 1, 1993. Large patches of the grass appeared to be dead.

Status

This unit contained miscellaneous construction debris from 1945 until the facility ceased operations. The debris was removed between 1984 and 1986, and the unit was closed for TWC in 1986. It was not RCRA-regulated under interim status.

Waste Type

This unit received miscellaneous non-hazardous construction rubble, including rock, brick, concrete, steel, wood, rubber, and paper. According to facility representatives, no other waste was ever disposed at this location.

Waste Management

Construction rubble was transported to this unit by trucks until 1970. The pile remained at this location until 1986, when the debris was excavated and transported by truck to the West Surface Impoundment (SWMU No. 27) to be used as fill.

Environmental Releases

There have been no documented or reported releases from this unit. Some discolored vegetation was observed at the site during the VSI on August 30 - September 1, 1993. Since the waste has been removed, it was not possible to assess the operating condition of the unit during the VSI.

Remedial Action Taken

Solid waste stored in this area was transported by truck to the West Surface Impoundment (SWMU No. 27) in 1986 and used as fill. TWC approved the closure plan for this unit on December 12, 1985. This unit was certified closed for TWC in 1986.

Suggested Action

ICF recommends no further action for this unit.

Reasons

Closure documents indicated that this unit managed only non-hazardous, solid waste containing no hazardous constituents (Jones and Neuse, 1987).

4.31 SWMU NO. 31 - WIRE MILL CONTAINER STORAGE AREA (Photograph 21)

Description

This area was a container storage area used to store drums of PCB-contaminated oil collected from transformers throughout the plant. The area measured approximately 30 feet by 15 feet and was surrounded by a six-inch concrete berm. The unit was situated inside a covered building with a locked security gate. The unit was located at the west end of the Mill Spares Building, west of the wire mill cleaning operations (SWMU Nos. 16 - 19).

During the VSI conducted August 30 - September 1, 1993, the concrete floor of this unit was still in place, but the berm and building structure had been removed. The site of the former unit was being used by Texas Distribution Services for storage of bags of calcium carbonate product. The concrete appeared to be of sound integrity, with no signs of cracks.

Status

This area was in use until 1987. The storage building and berming was torn down that same year. It was not RCRA-regulated under interim status.

Waste Type

This unit received 55-gallon drums of PCB-contaminated transformer oil that was generated on site. According to facility representatives, this area contained 12 drums in 1987. These drums were transported off site by Rollins Environmental Services of Deer Park, Texas for disposal. According to facility representatives, no waste was stored at this location after this shipment in 1987.

Waste Management

PCB-contaminated transformer oil was periodically collected from transformers at Armco's facility. According to facility representatives, drums were stored in this area for up to one year. If the PCB content of the oil was determined to be less than 500 ppm, Armco would drain the oil from transformers into 55-gallon drums and transfer them to this location. Aptus, a disposal contractor, would transport the drums off site to an Aptus facility in Coffeyville, Kansas. If PCB content exceeded 500 ppm, Aptus personnel would drain the oil and transport it in tank trucks to their disposal site.

Environmental Releases

There were no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993. The concrete pad appeared to be in good condition with no signs of cracks. No evidence of spills was observed during the VSI conducted on August 30 - September 1, 1993.

Remedial Action Taken

This building and the concrete berm surrounding this unit were torn down in 1987.

Suggested Action

ICF recommends no further action at this unit.

Reasons

The concrete pad appeared to be in good condition and the berm provided secondary containment.

4.32 SWMU NO. 32 - OPEN HEARTH CONTAINER STORAGE AREA (Photographs 22, 23, and 24)

Description

This unit consisted of an open, paved area that was used to store drums containing various wastes, such as flammable hazardous wastes, paint solvents, miscellaneous sludges, and waste lubricating oil (TWC, 1982). Until 1970, the area was the site of the cooling tower for the open hearth furnaces. Inactive pump wells for the cooling tower are

still in place to the east of this unit, as seen in the foreground of photograph no. 23. The area is approximately 40 feet by 30 feet, and is surrounded by a concrete berm. The area had an estimated capacity of 300 55-gallon drums, but was never used to store more than three waste drums at a time. The site was also used for storage of empty drums prior to reuse.

The unit is located east of the Machine Shops, adjacent to the Structure Mill, and north of the North and South Rod Mill Surface Impoundments (SWMU Nos. 28 and 29).

During the VSI conducted on August 30 - September 1, 1993, the concrete pad had extensive cracking and some rust-colored stains. Some weeds were observed in cracks in the concrete.

Status

This unit was used to store containers of waste until the mid-1980s. It was not RCRA-regulated under interim status.

Waste Type

This unit was used to store drums containing used oils from steel-manufacturing units and some waste solvents (F001 and F005) that were used for maintenance work within the facility. The used oils may have contained concentrations of cadmium, chromium, lead, arsenic, and organic halogens, and exhibited the RCRA hazardous characteristic of ignitability. Used oils also may have contained benzene, toluene, xylene, ethyl benzene, naphthalene, and phenanthrene.

Waste Management

Containers were transferred to this area from steel manufacturing and maintenance areas at the Armco plant. These containers were transported off site by Meklo Processing of Houston, Texas for disposal or recycling every 2 - 3 weeks.

Environmental Releases

There have been no documented or reported releases from this unit; however, extensive cracks and rust-colored stains in the concrete were observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

By the mid-1980s, all waste drums had been shipped off site for disposal or recycling. Armco submitted a closure plan in September 1992, and is currently awaiting official closure approval from TWC.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

This unit managed drums that contained RCRA-characteristic waste for toxicity and ignitability. During the VSI conducted on August 30 - September 1, 1993, cracks and stains were observed in the concrete base of the unit.

4.33 SWMU NO. 33 - WASTE PILE OF DISCARDED RAILROAD TIES (Photographs 25 and 26)

Description

This unit consists of an open waste pile of railroad ties and other miscellaneous solid waste measuring approximately 250 feet by 40 feet and reaching heights of 15 feet. The waste was generated during removal and repair of some of Armco's on-site rail lines.

This waste pile is located south of the Rod Mill Surface Impoundments (SWMU Nos. 28 and 29). A drainage ditch runs along the west side of the waste pile.

During the VSI, thick grass was observed in the area around the unit.

Status

This area has been used as an open collection area for an unknown period of time. It is not RCRA-regulated under interim status.

Waste Type

This unit is being used primarily to collect discarded non-hazardous railroad ties. During the VSI conducted on August 30 - September 1, 1993, the RFA Team also observed some other non-hazardous solid waste in this area, such as empty plastic pails, and miscellaneous wood and paper waste.

Waste Management

This area has been used to accumulate discarded railroad ties that have been generated during dismantling and repair of some of Armco's on-site rail lines. Some other miscellaneous solid waste is also being stored in this area. At the time of the VSI conducted on August 30 - September 1, 1993, the waste had not been taken off site for permanent disposal.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

This area is being used solely to collect non-hazardous materials, consisting primarily of discarded railroad ties. No other use was observed during the VSI conducted on August 30 - September 1, 1993.

4.34 SWMU NO. 34 - COKE AND SULFUR WASTE PILES (Photographs 27 and 28)

Description

This area was used to store coke and sulfur products in piles on an outdoor, dirt field measuring approximately 150 feet by five feet. These products became a waste when they were left on Armco's property after the owner (TexTrac) filed for bankruptcy. These waste piles were located just south of a drainage ditch that leads to NPDES-permitted Outfall No. 009 and to the west of the Direct Reduction Plant (SWMU No. 12). The coke and sulfur were removed by Armco in the early 1990s.

During the VSI conducted on August 30 - September 1, 1993, isolated, small piles of sulfur were still present over the area. The area consisted of hard packed dirt and gravel; some soil was discolored. Since most of the waste has been removed from this area, it not possible to assess the condition of the waste piles during the VSI.

Status

TexTrac used this area to store sulfur and coke products during the late 1980s. It was not RCRA-regulated under interim status.

Waste Type

This area consisted of a coke product pile and a sulfur product pile. This material became a waste once it was abandoned by TexTrac.

Waste Management

These piles were being stored by TexTrac for future use. These piles were abandoned by TexTrac when the company filed for bankruptcy.

Environmental Releases

During the VSI conducted on August 30 - September 1, 1993, remnants of the waste piles were observed, and the gravel and dirt in the area appeared discolored. Since most of the waste had been removed from this area, it was not possible to assess the condition of the waste piles during the VSI.

Remedial Action Taken

In the early 1990s, Armco removed the waste piles and shipped them off site for disposal.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

Since this area was used for open storage of coke and sulfur piles on unlined ground, this waste came into direct contact with the soil, and may have come into contact with ground water. In addition, proximity to a drainage ditch makes it likely that contaminated runoff was released to surface water.

4.35 SWMU NO. 35 - D&L BLAST AREA (Photographs 29 and 30)

Description

This area is used by D&L Quality Painting, Inc., for blasting of boxcars with aluminum oxide blast product to remove paint. This area is located at the southern end of the No. 1 Bar Storage Building, at a covered location. Blasting takes place on a concrete floor, where blast waste accumulates.

During the VSI conducted on August 30 - September 1, 1993, the concrete floor appeared to be in good condition with no signs of cracks or other deterioration.

Status

This area has been used by D&L for blasting since it began leasing this space in August 1992. It is not RCRA-regulated under interim status.

Waste Type

This area accumulates aluminum oxide blast waste that may include paint waste, which may contain lead and cadmium.

Waste Management

Blast waste accumulates in this area and is regularly scraped off the concrete floor and transported by a front-end loader to the D&L Spent Blast Dumpsters (SWMU No. 36).

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

Blasting takes place in a covered building. Good primary containment is provided by the concrete floor in the area. Waste is regularly transferred to a roll-off container.

4.36 SWMU NO. 36 - D&L SPENT BLAST DUMPSTERS (Photograph 31 and 32)

Description

These units consist of two open-top, 20-cubic yard, roll-off containers that receive spent aluminum oxide blast waste generated during the stripping of box cars and other items. The containers are located on a gravel and dirt area west of the No. 1 Bar Storage Building and the D&L Blast Area (SWMU No. 35). One of the containers is just south of the D&L Used Paint Can Dumpster (SWMU No. 37) in the foreground of photograph 31. The second container is located east of the dumpster.

During the VSI conducted on August 30 - September 1, 1993, the roll-off containers appeared to be in good condition. There were no signs of spills or contamination.

Status

This area has been used to store blast waste since D&L began leasing this area in August 1992. It is not RCRA-regulated under interim status.

Waste Type

These containers receive aluminum oxide blast waste that contains paint waste, which may contain lead and cadmium.

Waste Management

Blast waste generated at the D&L Blast Area (SWMU No. 35) is transferred by a front-end loader to the roll-off containers. BFI transfers this waste off site for disposal at its Houston, Texas, landfill every one to two weeks, according to D&L representatives.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

The roll-off containers appeared to be in good condition at the time of the VSI conducted on August 30 - September 1, 1993. There were no signs of waste spills observed during the VSI.

4.37 SWMU NO. 37 - D&L USED PAINT CAN DUMPSTER (Photograph 31)

Description

This unit consists of an open-top, 30-cubic yard, roll-off container used to collect empty paint cans. The container is located on a gravel and dirt area west of the No. 1 Bar Storage Building and the D&L Blast Area (SWMU No. 35), in the background of photograph 31. It is just to the north of one of the D&L Spent Blast Dumpsters (SWMU No. 36).

During the VSI conducted on August 30 - September 1, 1993, the roll-off container appeared to be in good condition. There were no signs of spills or contamination.

Status

This area has been used to store crushed empty paint cans since D&L began leasing this area in August 1992. It is not RCRA-regulated under interim status.

Waste Type

This unit receives empty metal paint cans that may contain paint residue. This residue may contain concentrations of lead and cadmium.

Waste Management

D&L staff routinely place empty metal paint cans in this roll-off container. BFI transfers this container off site within 90 days and disposes of the waste at its landfill in Houston, Texas.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

At the time of the VSI conducted on August 30 - September 1, 1993, the roll-off container appeared to be in good condition. There were no signs of waste spills observed during the VSI.

4.38 SWMU NO. 38 - D&L CONTAINER STORAGE AREA (Photograph 33)

Description

This unit is an area outside the Bar Storage Building that is used for less than 90-day storage of 55-gallon drums containing waste generated during painting and cleaning operations at D&L Quality Painting, Inc. Drums are stored on wooden pallets situated on a dirt and gravel surface. All drums were sealed at the time of the VSI on August 30 - September 1, 1993.

The area is located just west of the D&L Used Paint Can Dumpster (SWMU No. 37) and west of the No. 1 Bar Storage Building. At the time of the VSI, six 55-gallon drums were being stored in this area. The drums appeared to be in good condition, but some rust was observed on two of the drums, and some splattered paint was observed on the outside of one of the drums.

D&L began leasing this area in August 1992.

Status

This area has been used for less than 90-day storage of containers since August 1992, when D&L began leasing this area. It is not RCRA-regulated under interim status; however, this unit is permitted to operate as a less-than-90-day storage area.

Waste Type

This unit stores 55-gallon drums containing paint waste and spent catalyzed and uncatalyzed solvents.

Waste Management

This unit receives drums filled with waste generated during daily on-site cleaning of painting equipment. Approximately once a month, this waste is picked up by Laughlin Environmental of Houston, Texas for off-site incineration.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

During the VSI conducted on August 30 - September 1, 1993, there were no signs of spills, and the drums appeared to be in good condition.

4.39 SWMU NO. 39 - ECONO-RAIL CONTAINER STORAGE AREA (Photograph 34)

Description

This unit consists of a container storage area for two plastic salvage drums used to collect oil-related waste generated during cleaning and refurbishing of railroad cars. The drums are four feet tall, have an approximate capacity of 70 gallons each, and have screw-top lids. The first drum collects used oil filters, while the second collects oily rags. They are situated in the west end of the Hot Top Building on a two-inch raised concrete pad.

During the VSI conducted on August 30 - September 1, 1993, the drum for oil filters appeared to be in good condition. The drum used to collect oily rags had been taken off site by a disposal contractor. The concrete pad was in fair condition, with a few cracks observed.

Status

This unit has been in use since September 1990, when Econo-Rail began leasing this building from Armco. It is not RCRA-regulated under interim status.

Waste Type

Drums in this area collect used oil filters and oily rags.

Waste Management

Before repainting railroad cars, Econo-Rail wipes down the surface of the cars with damp rags, which collect oil and dirt. During repair of railroad cars, Econo-Rail sometimes replaces oil filters. The resulting oily rags and used oil filters are deposited in salvage drums that are periodically taken off site by O'Rourke Petroleum. The contents of the drums are incinerated at a steel mill, and the salvage drums are returned to Econo-Rail.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this area.

Suggested Action

ICF recommends no further investigation of this area.

Reasons

There were no signs of releases observed during the VSI on August 30 - September 1, 1993. The concrete pad was in fair condition, and the drum appeared to be of sound integrity.

4.40 SWMU NO. 40 - WESTINGHOUSE CONTAINER STORAGE AREA (Photographs 35, 36, 37, 38, and 39)

Description

This area is used by Westinghouse to store 55-gallon drums containing unknown wastes generated during cleaning and refurbishing of turbines. The drums are stored on wooden pallets, with the exception of one trichloroethylene drum, which is stored in a metal rack. No secondary containment is provided for liquid spills or releases from the drums. The drums appeared to be in fair to good condition, with some signs of rust, at the time of the VSI conducted on August 30 - September 1, 1993.

The area is located at the east end of the former Combination Mill Building. The floor of the area consists of concrete covered with some sand and gravel. At the time of the VSI conducted on August 30 - September 1, 1993, this area stored a total of eight waste drums. One drum was marked "waste paint," two were marked "waste oils," and one was marked "waste chemicals." Three drums were unmarked, and the drum in the metal rack was marked "trichloroethylene." Westinghouse representatives are not certain as to the exact contents of each of the drums. In addition to these drums containing waste, one drum containing Varsol product is also stored in the area. According to Westinghouse representatives, the drums have been used to collect various wastes for approximately three years, and have received waste during the past year.

At the time of the VSI conducted on August 30 - September 1, 1993, some dark staining was observed on the wooden pallet for the drum containing waste chemicals.

Status

This unit has been in use since shortly after Westinghouse began leasing this space in December 1988. Thus, drums containing waste have been stored in this area for several years without being shipped off site. The area is not permitted, but is subject to RCRA regulations.

Waste Type

During the VSI conducted on August 30 - September 1, 1993, seven 55-gallon waste drums were being stored in this area. The drums were identified as follows:

- Two drums labeled "waste oils";
- One drum labeled "waste paint";
- One drum labeled "waste chemicals";
- One drum labeled "trichloroethylene"; according to facility representatives, this chemical is a product that has expired;
- One unlabeled drum, which contained soapy rinse water, according to Westinghouse representatives;
- One unlabeled drum containing unknown material; and

- One drum used for storage of non-hazardous solid waste.

Waste Management

Some of the waste was generated from 1991 to 1992, during a job that involved cleaning, refurbishing, and repairing electrical turbines from 1991 until 1992. The trichloroethylene was originally used as a product for this cleaning. Westinghouse plans to dispose of the remaining trichloroethylene product in the near future because it has no use for this material, and its expiration date has passed.

Used oil is generated during disassembly of turbine engines. According to Westinghouse representatives, it takes Westinghouse approximately four years to generate one 55-gallon drum of used oil.

Westinghouse representatives were uncertain as to how other waste stored in this area was generated. According to Westinghouse representatives, Westinghouse plans to have the drums tested and removed in the near future.

Environmental Releases

There have been no documented or reported releases from this unit. At the time of the VSI conducted on August 30 - September 1, 1993, some dark staining was observed on the wooden pallet for the waste chemical drum.

Remedial Action Taken

According to facility representatives, during a recent internal audit, Westinghouse environmental compliance staff instructed the manager of this operation to have the drums tested and removed. Westinghouse representatives said that they had the contents of the trichloroethylene drum tested and had applied for a TWC Registration Number to authorize off-site shipment. No removals had taken place as of the VSI conducted on August 30 - September 1, 1993.

Suggested Action

ICF recommends that an RFI be conducted at this unit.

Reasons

This area has been used to store unknown hazardous wastes on a concrete and dirt floor for up to three years without a permit. Some of the drums appeared to be in only fair condition, and no secondary containment for liquid spills or releases is provided.

4.41 SWMU NO. 41 - TEXAS DISTRIBUTION SERVICES CONTAINER STORAGE AREA NO. 1 (Photographs 40, 41, and 42)

Description

This area is located along the southern side of the former Mill Spares Building, and west of the Wire Mill Warehouse. According to TDS representatives, this area is used exclusively for storage of product drums used for oil drilling equipment. At the time of the VSI conducted on August 30 - September 1, 1993, drums were stored on wooden pallets

and were stacked up to three drums high. Several drums were observed to have no lids. One of these drums contained a green-colored liquid that TDS representatives said was a soap engineered to cause dispersement of coke fines. Two other open drums contained a dry, lumpy, brown waste that appeared to be an asphalt or tar product. Material in the open drums was at least one foot from the top of the drums. The condition of the drums ranged from poor to good, with some signs of rust and deterioration, at the time of the VSI on August 30 - September 1, 1993, and no secondary containment was provided for liquid releases. The concrete base of the area appeared to be in good condition with no signs of cracks or spills; however, some gaps in the concrete and a large dirt hole west of the storage area were observed during the VSI.

Status

TDS has used this area for storage of product drums since September 1990, when TDS began leasing this space. This unit is not permitted, but may be subject to RCRA regulation.

Waste Type

This unit is used to store oil drilling products, including asphalt and coke products. In addition; during the VSI conducted on August 30 - September 1, 1993, TDS was using this area to store open-top drums containing a green soap-like liquid and an unknown, lumpy, brown, dry material or waste.

Waste Management

TDS uses this area to store oil drilling products until they are needed by their clients. TDS had no plans to dispose of any materials stored in this area.

Environmental Releases

There have been no documented or reported releases from this unit. Several open-top drums containing materials and some rainwater were observed during the VSI on August 30 - September 1, 1993. No signs of spills were observed on the concrete base of the area.

Remedial Action Taken

No remedial actions have been taken for this area.

Suggested Action

ICF recommends that an RFI be conducted for this unit.

Reasons

This unit is being used for storage of open drums containing product mixed with rainwater. TDS had no plans to remove these drums from the site; however, some of the drums appear to contain waste-like substances that are not suitable for sale or reuse.

4.42 SWMU NO. 42 - TEXAS DISTRIBUTION SERVICES CONTAINER STORAGE AREA NO. 2 (Photographs 43 AND 44)

Description

This area is located along the northern side of the Mill Spares Building, and west of the Wire Mill Warehouse. Although a TDS representative said that this area is used exclusively for storage of expired products used for oil drilling equipment, one drum labeled "Akti-Flow S" and "Waste - Do Not Use" was stored on a wooden pallet and secured with synthetic bands at the time of the VSI conducted on August 30 - September 1, 1993. Drums in this area were stored on wooden pallets and were stacked up to two drums high.

The drums appeared to be in good condition at the time of the VSI on August 30 - September 1, 1993. No secondary containment was provided for liquid releases. The concrete base of the area appeared to be in fair condition with some cracks and potholes observed.

Status

TDS has used this area for product storage since September 1990, when TDS began leasing this space. It is not permitted, but may be subject to RCRA-regulations.

Waste Type

This unit has been used to store expired product used for drilling operations. At the time of the VSI conducted on August 30 - September 1, 1993, the area also contained a drum labeled "Akti-Flow S" and "Waste - Do Not Use." A MSDS for this product was provided by TDS and indicated that it is a non-hazardous waste.

Waste Management

According to TDS representatives, all drums stored in this area are returned to their clients because they have expired, with the exception of one or two waste shipments that were sent to a landfill by TDS on behalf of the client. TDS was unable to provide records of these shipments or any further details.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

The drums appeared to be in good condition at the time of the VSI conducted on August 30 - September 1, 1993, and there were no signs of spills or leaks. According to TDS representatives and an MSDS, the waste drum in this area contained a non-hazardous waste.

4.43 SWMU NO. 43 - STOLT-NIELSEN WASTEWATER TANKS (Photograph 45)

Description

These unit consists of three 584-gallon and one 833-gallon horizontal tank units that are connected to rubber hoses used to transfer and collect wastewater generated during the on-site cleaning of train tanks that contain food residue. Stolt-Nielsen's operations take place in an uncovered area north of the Combination Mill. The wastewater tanks are located in a 40-foot by eight-foot concrete-paved area surrounded by a two-foot high concrete berm. The bermed area also contains 55-gallon drums containing product deodorizers and liquid detergent used during cleaning operations, and a diesel fuel tank. The bermed area is located adjacent to a rail line upon which train tanks are cleaned.

At the time of the VSI conducted on August 30 - September 1, 1993, the tanks appeared to be of sound integrity, and there were no signs of spills or contamination.

Status

These tanks have been in use since February 1989, when Stolt-Nielsen began leasing this space. They are not RCRA-regulated under interim status.

Waste Type

The tanks receive wastewater generated during steam cleaning of train tanks that contain food residue. This wastewater may contain small quantities of food residue, detergent, and deodorizers.

Waste Management

Wastewater is vacuumed into these tanks through rubber hoses after washing with detergent and deodorizer. Wastewater is regularly pumped from these tanks through rubber hoses to a train car, which transports the wastewater to a Stolt-Nielsen wastewater treatment facility three miles from the site.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

The tanks appeared to be in good condition at the time of the VSI. Secondary containment is provided by the two-foot high berm. No signs of spills were observed outside the berm.

4.44 SWMU NO. 44 - COASTAL CARGO VEHICLE REPAIR AREA (Photograph 46)

Description

This unit is a makeshift work area where Coastal Cargo repairs its trucks, front-end loaders, and other motor vehicles. The covered area measures approximately 40 feet by 25 feet by 25 feet tall. The area consists of a concrete pad covered by a steel truck container that is stacked upon two other truck containers. The area is located west of the Mold Foundry.

At the time of the VSI conducted on August 30 - September 1, 1993, the concrete pad in the area appeared to be of sound integrity with no signs of cracks or spills.

Status

This area has been in use for an unknown length of time. Coastal Cargo has been leasing this space since October 1991. It is not RCRA-regulated under interim status.

Waste Type

Basins and pails in this area receive used oil, used hydraulic fluid, and used transmission fluid generated during vehicle repair. The used oil may have contained concentrations of cadmium, chromium, lead, arsenic, and organic halogens, and had the RCRA hazardous characteristic for ignitability. Used oils also may contain benzene, toluene, xylene, ethyl benzene, naphthalene, and phenanthrene.

Waste Management

All waste generated in this area is collected in plastic and metal pails and basins. According to Coastal Cargo representatives, all waste is disposed of off site.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

There were no signs of spills observed, and the concrete floor is of sound integrity.

4.45 SWMU NO. 45 - NON-HAZARDOUS WASTE PILE (Photographs 47 and 48)

Description

The unit consists of a waste pile of miscellaneous debris measuring approximately 12 feet by six feet, located inside the Structure Mill Building. During the VSI conducted on August 30 - September 1, 1993, the pile contained broken concrete and corroded metal pipe and grating. A drain covered by steel grating is located adjacent to the north of the waste pile.

The floor of this area consists of gravel and dirt. Currently, no tenants are leasing this space.

Status

This unit has served as an accumulation area for miscellaneous non-hazardous solid waste for an unknown period of time. It is not RCRA-regulated under interim status.

Waste Type

This unit stores miscellaneous rubble,

Waste Management

Miscellaneous rubble of unknown origin is stored in this area. There are no scheduled plans for removal.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for this unit.

Suggested Action

ICF recommends no further investigation of this unit.

Reasons

This area is being used to collect non-hazardous waste rubble. No other use was observed during the VSI conducted on August 30 - September 1, 1993.

4.46 SWMU NO. 46 - VARIOUS SOLID WASTE AND SCRAP METAL DUMPSTERS (Photographs 49 and 50)

Description

This unit consists of dumpsters and roll-off containers of varying sizes and types, that are used by individual tenants at the Greensport Industrial Park to collect non-hazardous solid waste and scrap metal. These dumpsters are stored on concrete pads, and the integrity of each of these units appeared to be sound during the VSI conducted on August 30 - September 1, 1993.

Status

These units have been used for varying lengths of time, depending on the length of the user's lease and changes in business practices. They are not RCRA-regulated under interim status.

Waste Type

These units receive non-hazardous solid waste and scrap metal.

Waste Management

These dumpsters are used to collect non-hazardous solid waste and scrap metal. They are periodically emptied by disposal contractors and scrap metal recyclers and taken off site for disposal or reprocessing. Disposal contractors used by lessees at the Greensport Industrial Park include the following:

- Acco Waste Disposal, Inc.;
- Houston Compressed Steel;
- J.E.C. Waste;
- Proler Metal Processing;
- Robinson Scrap and Tank;
- Star Disposal, Inc.;
- Waste Management, Inc.; and
- Western Waste Control.

Environmental Releases

There have been no documented or reported releases from this unit, and there were no signs of releases observed during the VSI on August 30 - September 1, 1993.

Remedial Action Taken

No remedial actions have been taken for these units.

Suggested Action

ICF recommends no further investigation of these units.

Reasons

The integrity of these units appeared to be sound. The dumpsters are used for collection of non-hazardous solid waste and scrap steel, and there were no signs of releases observed during the VSI conducted on August 30 - September 1, 1993.

5.0 AREAS OF CONCERN

There were no Areas of Concern identified during the VSI conducted on August 30 - September 1, 1993.

6.0 HUMAN AND ENVIRONMENTAL TARGETS

Potential exposure to local residents and workers is low because the only wastes left from steel operations at the facility are buried and there is only a slight chance of human contact. Potential exposure to the environment through the soil and ground water is high due to the wastes contained in closed surface impoundments at the facility.

This section discusses the potential human and environmental targets of a release of hazardous material into the environment from SWMUs at the Armco site. Potential pathways include air, soil, subsurface gas, surface water, and ground water.

6.1 AIR

Currently, there are no steel-making processes generating air emissions at the Armco facility. The only wastes left in place from steel operations are capped and do not generate air emissions.

Air emissions could be generated from the D&L Blast Area (SWMU No. 35) and from the D&L Spent Blast Dumpsters (SWMU No. 36). These dumpsters were not covered and were full of spent blast media during the VSI conducted August 30 - September 1, 1993. The potential impact of these emissions on employees is not known because of a lack of data characterizing these emissions and their probable effects. Because of the relatively low emissions, air releases are not likely to affect individuals in surrounding communities.

6.2 SOIL

During the VSI conducted on August 30 - September 1, 1993, signs of potential surface-soil contamination were observed at the area of the former Coke and Sulfur Waste Piles (SWMU No. 34), which were discarded by TexTrac, a previous tenant of the Greensport Industrial Park. This area contained remnants of the waste piles and had discolored soil.

There is a potential for soil contamination from any of the closed surface impoundments that were used to dispose of hazardous waste. The potential for soil contamination at the East Acid Surface Impoundment (SWMU No. 22) is very high, as discolored grass was observed on the eastern half of this unit. Other closed surface impoundments at Armco could contaminate the surrounding subsurface soil if waste seeps through the base of the units. At closure of some of these units, sampling of the remaining liquid waste was conducted. The surface impoundments at the Armco site and the results of sampling analysis are described below:

- East End Surface Impoundment (SWMU No. 21), for which no sampling results were available;
- East Acid Surface Impoundment (SWMU No. 22), where waste sampling data revealed acidic discharge with high phenol, lead, and TOC content;

- West Surface Impoundment (SWMU No. 27), where waste sampling data revealed high levels of barium, lead, selenium, TOC, and fluoride;
- North Rod Mill Surface Impoundment (SWMU No. 28), where waste sampling data revealed high levels of lead, cadmium, and fluoride; and
- South Rod Mill Surface Impoundment (SWMU No. 29), where waste sampling data revealed high levels of lead, iron, zinc, and magnesium.

There is a high potential that releases to subsurface soil could occur from these surface impoundments.

Units that have been dismantled and removed from the site were also potential areas of soil contamination. Soil sampling data for many of these units were unavailable at the time of the VSI conducted on August 30 - September 1, 1993, and the containment for these units could not be assessed by the RFA Team, as Armco did not have any engineering drawings or other documents for these units. However, based on interviews conducted during and after the VSI, some concerns can be generalized:

- Since some units were in open areas without secondary containment for liquid releases, they could have contaminated nearby soil if a leak or spill occurred. These units include the following:
 - Units associated with the Coke Plant Incinerator (SWMU Nos. 2 - 6);
 - The clarifier portions of the Sinter Plant (SWMU No. 9), the Blast Furnace (SWMU No. 10), and the Direct Reduction Plant (SWMU No. 12);
 - Electric Furnace Shop Nos. 1 and 2 Clarifiers and Storage Area (SWMU No. 13);
 - The Mold Foundry Settling Chamber (SWMU No. 20);
 - The Central Mill System Scale Basin (SWMU No. 23);
 - The Ditches and Settling Basin for the West Surface Impoundment (SWMU No. 25);
 - The Used Oil Storage Tank (SWMU No. 26); and
 - The Open Hearth Container Storage Area (SWMU No. 32).
- Open waste piles containing hazardous constituents were likely to have contaminated soil at their former locations. These units include the Ore Bedding Area (SWMU No. 7) and the Blast Furnace Sludge Waste Pile (SWMU No. 8). The sites of these piles consisted of dirt and gravel, and hazardous constituents could have leached from the piles into the soil. For

example, sampling of the Blast Furnace Sludge Waste Pile (SWMU No. 8) showed high levels of cadmium, lead, mercury, and fluoride.

6.3 SUBSURFACE GAS

No evidence has been found to suggest that subsurface gas generation and migration are a potential problem at the Armco facility.

6.4 SURFACE WATER

Armco maintains NPDES and TWC permits for systematic discharge of wastewater to the Houston Ship Channel. These permits have been modified to reflect changes in operations at the site as new processes were added to the steel operations. Numerous violations at the permitted outfalls have been cited in recent years; these include violations for failing to meet reporting requirements and exceeding permit limits for various parameters. The facility's permitted sanitary sewage discharge has been the focus of many inspection and violation reports.

During the VSI conducted on August 30 - September 1, 1993, signs of potential surface-water contamination were observed near the area of the former Coke and Sulfur Waste Piles (SWMU No. 34), which were abandoned by TexTrac, a previous tenant of the Greensport Industrial Park. The site had discolored soil and sloped to the north toward a drainage ditch, which leads to NPDES-permitted Outfall 009.

Ground-water to surface-water contamination is a potential concern. Ground-water sampling done at closure of the East Acid Surface Impoundment (SWMU No. 22) showed low pH and elevated levels of TOC, phenol, and lead. The nature of the geologic deposits indicates that the contaminants would be contained in the upper aquifer and that ground-water flow is in the direction of the Houston Ship Channel; the contaminants potentially could discharge to the channel (ERM-Southwest, Inc., 1984). This surface impoundment is approximately 500 feet from the Houston Ship Channel, and the East End Surface Impoundment (SWMU No. 21) is approximately 250 feet from the channel. Other closed surface impoundments, though farther from the channel, also could contribute to surface-water contamination. These units include the West Surface Impoundment (SWMU No. 27) and the North and South Rod Mill Surface Impoundments (SWMU Nos. 28 and 29). Sampling data of these surface impoundments revealed high levels of barium, lead, selenium, TOC, cadmium, fluoride, iron, zinc, and magnesium.

6.5 GROUND WATER

There are 13 active wells used for potable water for approximately 300 workers on site. These wells tap a deep aquifer at 600 - 2,500 feet. The water table at the Armco site is reached at 5 - 30 feet; any contamination to this upper aquifer would be contained by a confining layer of clay (Engineering-Science, Inc., 1984). Therefore, the potential for human exposure through ground water is low.

However, there is a high potential of ground-water contamination of the upper aquifer from surface impoundments because they are clay-lined and constructed of earthen materials. Ground-water sampling done at closure of the East Acid Surface Impoundment (SWMU No. 22) showed localized contamination of the upper aquifer. The East End Surface Impoundment (SWMU No. 21), the West Surface Impoundment (SWMU No. 27), and the North and South Rod Mill Surface Impoundments (SWMU Nos. 28 and 29) could similarly contribute to ground-water contamination.

Units that have been dismantled and removed from the site are also a potential source of ground-water contamination if wastes were released to the soil and percolated to ground water. Based on interviews conducted during and after the VSI, some concerns about ground-water contamination can be generalized:

- Since some units were in open areas without secondary containment for liquid releases, they could have contaminated ground water if a leak or spill occurred. These units include the following:
 - Units associated with the Coke Plant Incinerator (SWMU Nos. 2 - 6);
 - The clarifier portions of the Sinter Plant (SWMU No. 9), the Blast Furnace (SWMU No. 10), and the Direct Reduction Plant (SWMU No. 12);
 - Electric Furnace Shop Nos. 1 and 2 Clarifiers and Storage Area (SWMU No. 13);
 - The Mold Foundry Settling Chamber (SWMU No. 20);
 - The Central Mill System Scale Basin (SWMU No. 23);
 - The Ditches and Settling Basin for the West Surface Impoundment (SWMU No. 25);
 - The Used Oil Storage Tank (SWMU No. 26); and
 - The Open Hearth Container Storage Area (SWMU No. 32).
- Open waste piles containing hazardous constituents were likely to have contaminated ground water at their former locations. These units include the Ore Bedding Area (SWMU No. 7) and the Blast Furnace Sludge Waste Pile (SWMU No. 8). The sites of these piles consisted of dirt and gravel, and hazardous constituents could have leached from the piles into the ground water. For example, sampling of the Blast Furnace Sludge Waste Pile (SWMU No. 8) showed high levels of cadmium, lead, mercury, and fluoride.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Forty-six SWMUs and no AOCs have been identified at Armco. Thirteen SWMUs are active. The active SWMUs include:

- Waste Pile of Discarded Railroad Ties (SWMU No. 33);
- D&L Blast Area (SWMU No. 35);
- D&L Spent Blast Dumpsters (SWMU No. 36);
- D&L Used Paint Can Dumpster (SWMU No. 37);
- D&L Container Storage Area (SWMU No. 38);
- Econo-Rail Container Storage Area (SWMU No. 39);
- Westinghouse Container Storage Area (SWMU No. 40);
- Texas Distribution Services Container Storage Area No. 1 (SWMU No. 41);
- Texas Distribution Services Container Storage Area No. 2 (SWMU No. 42);
- Stolt-Nielsen Wastewater Tanks (SWMU No. 43);
- Coastal Cargo Vehicle Repair Area (SWMU No. 44);
- Non-hazardous Waste Pile (SWMU No. 45); and
- Various Solid Waste and Scrap Metal Dumpsters (SWMU No. 46).

Table 7-1 summarizes the status, waste type, waste management, releases, migration pathways, and remedial actions for all SWMUs.

**Table 7-1
SWMU Summary**

Unit	SWMU No. 1	SWMU No. 2	SWMU No. 3
Unit Name	Coke Plant Tar Decanter System	Coke Plant Ammonia Liquor Sump	Coke Plant Ammonia Liquor Transfer Pump
Description	Two carbon steel, above-ground, closed-top tanks, and fiber containers	In-ground, open-top, concrete tank with a steel grating	Transfer pump
Operating Status	Inactive since 1984; removed	Inactive since 1984; certified closed for TWC	Inactive since 1984; certified closed for TWC
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Tar decanter sludge (K087) from the flushing liquor and primary coolers	Excess ammonia liquor, after being used to cool coke oven gas	Excess ammonia liquor, after being used to cool coke oven gas
Waste Management	Tar sludge pumped through dedicated piping and stored in receiving tank; tar skimmed off the mixture and raked to tar storage tank; contents periodically collected and transported off site; sludge in receiving tank raked into fiber containers and transferred to the East Acid Surface Impoundment (SWMU No. 22) or off-site	Ammonia liquor waste pumped through dedicated piping; waste normally fed from the unit continuously into incinerator; when incinerator was not operating, waste transferred to the Coke Plant Ammonia Liquor Transfer Pump (SWMU No. 3) and pumped to Coke Plant Ammonia Liquor Storage Tank (SWMU No. 4) for temporary storage	Ammonia liquor waste was pumped from the Coke Plant Ammonia Liquor Sump (SWMU No. 2) through dedicated piping to the Coke Plant Ammonia Liquor Storage Tank (SWMU No. 4), if excess capacity was needed to store this waste
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	Dismantled and removed	At closure, unit and piping rinsed, dismantled, and removed; sump hole filled	At closure, unit and piping rinsed, dismantled, and removed
Release Potential	Moderate	Moderate	Moderate
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	No secondary containment; integrity could not be assessed	Integrity could not be assessed; no sampling data	Integrity could not be assessed; no sampling data
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 4	SWMU No. 5	SWMU No. 6
Unit Name	Coke Plant Ammonia Liquor Storage Tank	Coke Plant Ammonia Liquor Feed Pump	Coke Plant Incinerator
Description	70,000-gallon, carbon steel, above-ground tank	Transfer pump	Ammonia liquor waste incinerator with no emissions control
Operating Status	Inactive since 1984; certified closed for TWC	Inactive since 1984; certified closed for TWC	Inactive since 1984; certified closed for TWC
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Unknown
Waste Type	Excess ammonia liquor, after being used to cool coke oven gas	Excess ammonia liquor, after being used to cool coke oven gas	Excess ammonia liquor, after being used to cool coke oven gas
Waste Management	Ammonia liquor waste was received from the Coke Plant Ammonia Liquor Sump (SWMU No. 2) via the Coke Plant Ammonia Liquor Transfer Pump (SWMU No. 3), and transferred to the Coke Plant Incinerator (SWMU No. 6) via the Ammonia Liquor Feed Pump (SWMU No. 5)	Ammonia liquor waste was pumped from the Coke Plant Ammonia Liquor Storage Tank (SWMU No. 4) to the Coke Plant Incinerator (SWMU No. 6) through dedicated piping	Ammonia liquor waste was fed continuously from the Coke Plant Ammonia Liquor Sump (SWMU No. 2), or from the Coke Plant Ammonia Liquor Storage Tank (SWMU No. 4)
Release History	None	None	Emissions generated during burning of ammonia liquor waste
Release Pathway	N/A	N/A	Air
Remedial Action Taken	At closure, contents removed and disposed off-site; tank hydroblasted, dismantled, and removed	At closure, unit and piping rinsed, dismantled, and removed	At closure, dismantled and removed
Release Potential	Moderate	Moderate	High
Potential Pathway	Soil, ground water	Soil, ground water	Air, soil, ground water
Reason for Release Potential Rating	Integrity could not be assessed; no sampling data available	Integrity could not be assessed; no sampling data available	Integrity could not be assessed; no sampling data available
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 7	SWMU No. 8	SWMU No. 9
Unit Name	Ore Bedding Area	Blast Furnace Sludge Waste Pile	Sinter Plant
Description	Open, unlined area and elevated conveyor used to store and transfer material	Open waste pile of furnace sludge	Furnace, elevated conveyor, emission control equipment, and clarifying basin
Operating Status	Inactive since 1984; removed	Inactive since 1984; certified closed for TWC	Inactive since early 1980s; removed
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Dust and sludge from the blast furnace, mill scale, oil, grease, and ore fines layered with lime and coke	Sludge waste containing fine particles of iron ore, coke, limestone, and heavy metals	Furnace dust, sludge, and fines; metal fines; generated sinter dust, mill scale, gaseous emissions, and wastewater
Waste Management	Dust and sludge from the Blast Furnace Sludge Waste Pile (SWMU No. 8) periodically excavated and layered in this area with limestone, coke breeze, and ore fines collected from the plant; mill scale, oil, and grease were also transferred from steel-processing areas and layered; layered material placed on a conveyor and fed into the Sinter Plant	Sludge waste from Blast Furnace (SWMU No. 10) and Direct Reduction Plant (SWMU No. 12) transferred by truck; waste was allowed to dry and was then transferred to the Ore Bedding Area (SWMU No. 7)	Conveyor belt transferred iron-bearing materials from the Ore Bedding Area (SWMU No. 7) to furnace to produce sinter, which was transferred to the Blast Furnace (SWMU No. 10) for use in iron-making processes; sinter fines were returned to the Ore Bedding Area
Release History	Waste came into direct contact with soil	Waste came into direct contact with soil	Treated gaseous emissions released to atmosphere
Release Pathway	Soil	Soil	Air
Remedial Action Taken	All accumulated materials fed to Sinter Plant	Waste pile was excavated and transferred by truck to the West Surface Impoundment (SWMU 27)	Dismantled and demolished
Release Potential	High	High	High
Potential Pathway	Soil, ground water, surface water	Soil, ground water, surface water	Air, soil, ground water
Reason for Release Potential Rating	Waste placed on open area with no lining	Waste placed on open area with no containment; lead and cadmium levels NIPDWS limits; proximity to ground water	Integrity could not be assessed; no secondary containment
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 10	SWMU No. 11	SWMU No. 12
Unit Name	Blast Furnace	Coke Plant Quenching Basin and Tower	Direct Reduction Plant
Description	225-foot tall cylindrical furnace with 22-foot diameter stoves, elevated conveyor, emission control equipment, and clarifying basin	Concrete basin and tower	Pilot plant designed to reduce iron ore for use in steel making
Operating Status	Inactive since 1982; removed	Inactive since early 1980s; removed	Inactive since 1973; removed
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Sinter, lime, and ore fines received; blast furnace gas, dust, sludge, and wastewater generated	Blast furnace blowdown, wastewater, and surface water	Dust and sludge generated
Waste Management	Sinter from the Sinter Plant (SWMU No. 9) burned with iron ore, lime, and coke; blast furnace sludge, dust, and wastewater were generated by gas cleaning processes and transferred via conveyor belts to the Blast Furnace Sludge Pile (SWMU No. 8); wastewater recycled and blowdown pumped to the Coke Plant Quenching Basin and Tower (SWMU NO. 11)	Blowdown from the Blast Furnace (SWMU No. 10) and wastewater from the West Surface Impoundment (SWMU No. 27) were sprayed on hot coke to cool the coke and vaporize blowdown; coke was transferred to Blast Furnace (SWMU No. 10)	Sludge and dust were generated by gas cleaning processes and regularly transferred by conveyor to the Ore Bedding Area (SWMU No. 7)
Release History	Treated gaseous emissions	Vaporization likely to have released contaminants	Treated gaseous emissions
Release Pathway	Air	Air	Air
Remedial Action Taken	Dismantled and demolished	Dismantled and demolished	Dismantled and demolished
Release Potential	High	High	High
Potential Pathway	Air, soil, ground water	Air, soil, ground water	Air, soil, ground water
Reason for Release Potential Rating	No secondary containment; integrity could not be assessed	Highly contaminated vapor blowdown was released; integrity could not be assessed	No secondary containment; integrity could not be assessed
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 13	SWMU No. 14	SWMU No. 15
Unit Name	Electric Furnace Shop Nos. 1 and 2 Clarifiers and Storage Area	Electric Furnace Shop No. 2 Baghouse	Electric Furnace Shop No. 2 Baghouse Dust Storage Area
Description	35- and 70-foot diameter concrete basins; two vacuum filters and roll-off containers	Large baghouse facility	Roll-off containers used to store electric furnace dust
Operating Status	Inactive since 1984; removed	Inactive since 1984	Inactive since 1984; removed
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Electric furnace wastewater and sludge (K061) that are RCRA toxic	RCRA toxic baghouse dust (K061) containing hexavalent chromium, lead, and cadmium	RCRA toxic pelletized electric furnace dust waste (K061)
Waste Management	Clarifiers received wastewater from Electric Furnace Shops and allowed settling of sludge; recovered sludge was pumped through vacuum filters; filter cake was collected in roll-off containers before being transported off-site for disposal	Continuously removed electric furnace dust particles from emissions; dust was vacuumed into bags and periodically transferred to a pelletizer; pelletized dust released to roll-off containers at the Electric Furnace Shop No. 2 Baghouse Dust Storage Area (SWMU No. 15)	Dust shaken out of Electric Furnace No. 2 Baghouse (SWMU No. 14) onto a conveyor system that transferred the dust to a pelletizer; pelletized dust released to roll-off containers situated directly below the pelletizer; roll-off containers were transported off-site daily
Release History	None	Treated gaseous emissions	None
Release Pathway	N/A	Air	N/A
Remedial Action Taken	Dismantled and removed	None	Roll-off containers removed from site
Release Potential	Moderate	Low	Low
Potential Pathway	Soil, ground water	Air	Soil, ground water
Reason for Release Potential Rating	No secondary containment; integrity could not be assessed	Dust was removed, transferred, and pelletized in an enclosed system	Pelletized dust released to roll-off containers directly under pelletizer
Need for RFI	Yes	No	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 16	SWMU No. 17	SWMU No. 18
Unit Name	Spent Pickle Liquor Tanks	Copper Coating Solution Tank	Permanganate Tank
Description	Concrete, acid brick-lined, above-ground, open-top tanks	Open-top, steel tank in concrete, acid brick-lined, above-ground, open-top basin	Open-top, steel tank in concrete, acid brick-lined, above-ground, open-top basin
Operating Status	Inactive since 1984; removed	Inactive since 1984; removed	Inactive since 1984; removed
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Spent pickle liquor solution (K062), containing sulfuric acid and solvents	Discarded copper coating solution	Discarded permanganate coating solution
Waste Management	Steel wire was dipped into acid in these tanks to remove scale (iron oxide); when the strength of the pickle liquor diminished, it was transported off-site	Waste copper coating solution was generated when solution could no longer be used to produce copper-coated wire; transported off-site	Waste permanganate coating solution was generated when solution could no longer be used to produce permanganate-coated wire; transported off-site
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	Dismantled and removed	Dismantled and removed	Dismantled and removed
Release Potential	Moderate	Moderate	Moderate
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Treatment performed in open tanks; no secondary containment; integrity could not be assessed	Treatment performed in open tanks; no secondary containment; integrity could not be assessed	Treatment performed in open tanks; no secondary containment; integrity could not be assessed
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 19	SWMU No. 20	SWMU No. 21
Unit Name	Rinse Tank for Wire Mill Cleaning	Mold Foundry Settling Chambers	East End Surface Impoundment
Description	Open-top, steel tank in concrete, acid brick-lined, above-ground, open-top basin	Above-ground, concrete basin and associated equipment	100-foot by 60-foot, 2,000-cubic yard surface impoundment
Operating Status	Inactive since 1984; removed	Inactive since 1984; removed	Inactive since 1980
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Water containing concentrations of spent pickle liquor (K062)	Wastewater containing mold foundry sand and oily mill scale	Mold foundry sand and small quantities of oily mill scale
Waste Management	Waste periodically transferred to the West Surface Impoundment (SWMU No. 27) via Ditches and Settling Basin for West Surface Impoundment (SWMU No. 25)	Mold Foundry wastewater passed through a clarifier and filter; Mold Foundry sand disposed off-site or transferred to the East End Surface Impoundment (SWMU No. 21); residual wastewater recycled -- excess wastewater discharged through Outfall 015	Mold Foundry sand transported to this unit when it could not be hauled off-site; limestone was periodically mixed with waste while the unit was active; overflow from the surface impoundment ran to Outfall 015 (011)
Release History	None	None	Soil, ground water
Release Pathway	N/A	N/A	Potential migration through clay liner
Remedial Action Taken	Dismantled and removed	Dismantled and removed	Backfilled with natural soils after unit ceased receiving waste
Release Potential	Moderate	Moderate	High
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water, surface water
Reason for Release Potential Rating	Treatment performed in open tanks; no secondary containment; integrity could not be assessed	Unit located in open area without secondary containment; integrity could not be assessed	Clay-lined surface impoundment constructed of earthen materials; shallowest aquifer 30 feet below unit
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 22	SWMU No. 23	SWMU No. 24
Unit Name	East Acid Surface Impoundment	Central Mill System Scale Basin	Central Furnace System Cooling Tower and Basin
Description	400-foot by 100-foot by 15-foot deep clay-lined, surface impoundment	Settling basin with two chambers, approximately 250 feet by 125 feet	Cooling tower and concrete basin used to cool non-contact cooling water
Operating Status	Inactive since 1973	Inactive since early 1980s; removed	Inactive since 1984; removed
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Tar decanter sludge (K087); spent pickle liquor (K062)	Process wastewater with mill scale, oil, and grease	Non-contact cooling tower blowdown
Waste Management	Received miscellaneous waste from the coke plant through a slag thimble	Wastewater received in the first chamber of the unit; some wastewater pumped from this chamber to the Central Rolling Mills for reuse; excess wastewater pumped to the second chamber for further settling, then discharged to West Surface Impoundment (SWMU No. 27) via the Ditches and Settling Basin for West Surface Impoundment (SWMU No. 25)	Blowdown was pumped from the cooling tower into a concrete basin; after cooling, blowdown was discharged to the West Surface Impoundment (SWMU No. 27) via the Ditches and Settling Basin for the West Surface Impoundment (SWMU No. 25)
Release History	Acidic waste detected in ground water	None	None
Release Pathway	Soil, ground water	N/A	N/A
Remedial Action Taken	Filled (1973); capped (1982)	Dismantled and removed	Dismantled and removed
Release Potential	High	Moderate	Low
Potential Pathway	Soil, ground water, surface water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Clay-lined and constructed of earthen materials; ground water monitoring indicated contamination, which may migrate to surface water	No secondary containment; integrity could not be assessed	Unit managed only non-contact cooling water
Need for RFI	Yes	Yes	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 25	SWMU No. 26	SWMU No. 27
Unit Name	Ditches and Pumping Basin for West Surface Impoundment	Used Oil Storage Tank	West Surface Impoundment
Description	Unlined drainage ditches and a concrete settling basin	10,000-gallon, above-ground, carbon steel tank	2.5-acre, 10,000,000-gallon surface impoundment
Operating Status	Ditches inactive since 1984; basin removed	Inactive since 1984; removed	Certified closed for TWC in 1986
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Process wastewater containing mill scale, oil and grease; rinse water containing pickle liquor; non-contact cooling water	Used oil contained in process wastewater	Mill scale and process wastewater; rinsate contaminated with spent pickle liquor; blast furnace sludge; stormwater
Waste Management	Process wastewater from the Central Mill System Scale Basin, the Rod Mill Surface Impoundments, and the Rinse Tank for Wire Mill Cleaning transferred to the West Surface Impoundment; skimmed oil transferred to Used Oil Storage Tank	Used oil collected by oil skimmers in the Settling Basin for the West Surface Impoundment (SWMU No. 25) was received; within 90 days, the used oil was transported off site by a waste oil recycler	Received wastewater from clarifier units, rinse tanks, and scale basins; waste water recycled to Electric Furnace Shop No. 2 or discharged through outfall; during facility closure, received waste from Construction Rubble Waste Pile, North Rod Mill Surface Impoundment, and Blast Furnace Sludge Waste Pile
Release History	Waste in direct contact with soil	None	Migration to clay liner; excess wastewater discharged to Channel
Release Pathway	Soil, ground water	N/A	Soil, ground water, surface water
Remedial Action Taken	Ditches grouted or filled; pump basin removed	Dismantled and removed	Unit was capped with recompacted clay and soil
Release Potential	High	Low	High
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water, surface water
Reason for Release Potential Rating	Unlined earthen culverts; shallow aquifer within 30 ft	Integrity not known; no secondary containment	Waste may migrate through clay liner; shallow aquifer
Need for RFI	Yes	Yes	Yes

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 28	SWMU No. 29	SWMU No. 30
Unit Name	North Rod Mill Surface Impoundment	South Rod Mill Surface Impoundment	Construction Rubble Waste Pile
Description	Northern portion of an 8.7 million gallon horseshoe-shaped surface impoundment	Southern portion of an 8.7 million horseshoe-shaped surface impoundment	Waste pile containing non-hazardous solid waste
Operating Status	Inactive since 1970; certified closed for TWC	Inactive since 1970; certified closed for TWC	Inactive since 1986; certified closed for TWC
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Cooling water from the Rod Mill, containing mill scale, grease, and oil	Cooling water from the Rod Mill, containing mill scale, grease, and oil; sludge	Miscellaneous construction debris (e.g., rock, brick, concrete, steel, wood, rubber)
Waste Management	Wastewater received from Rod Mill for settling; wastewater was recycled to the Rod Mill; at closure, waste was excavated and transferred to the South Rod Mill Surface Impoundment (SWMU No. 29) or the West Surface Impoundment (SWMU No. 27) for disposal	Cooling water for the Rod Mill received; wastewater recycled to the Rod Mill; also received portions of the sludge from West Surface Impoundment (SWMU No. 27) and North Rod Mill Surface Impoundment (SWMU No. 28)	Solid construction waste was received until 1970; pile remained at this location until 1986, when the debris was excavated and transported by truck to the West Surface Impoundment (SWMU No. 27) to be used as fill
Release History	Potential migration through clay liner; high levels of lead and cadmium in ground water	Potential migration through clay liner; high levels of lead and cadmium in ground water	None
Release Pathway	Soil, ground water	Soil, ground water	N/A
Remedial Action Taken	Capped and certified closed for TWC	Capped and certified closed for TWC	Waste transported by truck, used as fill; certified closed
Release Potential	High	High	Low
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Likely migration through clay liner; shallowest aquifer within 30 feet; sampling indicates high lead and cadmium levels	Likely migration through clay liner; shallowest aquifer within 30 feet; sampling indicates high lead and cadmium levels	Closure plan documents that only non-hazardous waste containing no hazardous constituents managed at this unit
Need for RFI	Yes	Yes	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 31	SWMU No. 32	SWMU No. 33
Unit Name	Wire Mill Container Storage Area	Open Hearth Container Storage Area	Waste Pile of Discarded Railroad Ties
Description	Container storage area, measuring approximately 30 feet by 15 feet and surrounded by a six-inch concrete berm, located inside a covered building with a locked security gate	Open paved area, measuring approximately 40 feet by 30 feet and surrounded by a concrete berm, used to store drums	Waste pile of railroad ties and other miscellaneous solid waste, measuring approximately 250 feet long by 40 feet wide by 15 feet high (at its highest point)
Operating Status	Inactive since 1987; removed	Inactive since mid-1980s	Operating for an unknown period of time
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	55-gallon drums containing PCB-contaminated transformer oil	55-gallon drums containing used oils from steel manufacturing units and some waste solvents (F001 and F005)	Discarded railroad ties and other solid waste, such as miscellaneous wood, plastic, and paper waste
Waste Management	If PCB content of oil was determined to be less than 500 ppm, it was drained into 55-gallon drums and transferred to this unit	Containers were transferred to this area from steel manufacturing and maintenance areas; containers were transported off-site for disposal or recycling	Discarded railroad ties were accumulated as a result of dismantling and repair of on-site rail lines; plans for removal are unknown
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	Buildings and berming demolished	Waste drums shipped off-site for disposal or recycling	None
Release Potential	Low	Moderate	Low
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water, surface water
Reason for Release Potential Rating	Concrete pad in good condition; berm provided secondary containment	Cracks were observed in concrete base of unit	Area used solely to collect non-hazardous solid waste containing non-hazardous constituents
Need for RFI	No	Yes	No

Table 7-1
SWMU Summary (Continued)

Unit	SWMU No. 34	SWMU No. 35	SWMU No. 36
Unit Name	Coke and Sulfur Waste Piles	D&L Blast Area	D&L Spent Blast Dumpsters
Description	Open dirt field containing coke waste pile and sulfur waste pile and measuring 150 feet by 5 feet	Covered blasting area with concrete floor	Two open-top, 20-cubic yard, roll-off containers
Operating Status	Inactive since late 1980s; removed	Active since 1992	Active since 1992
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Abandoned sulfur and coke product	Blast waste containing paint waste	Blast waste containing paint waste
Waste Management	Coke and sulfur product piles were stored in this area; these piles became a waste when they were abandoned by TexTrac	Blast waste accumulates and is scraped off the concrete floor and transported by front-end loader to the D&L Spent Blast Dumpsters (SWMU No. 36)	Blast waste generated at the D&L Blast Area (SWMU No. 35) is transferred by front-end loader to roll-offs; waste is transferred off-site for disposal
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	Waste piles removed and shipped off site for disposal	None	None
Release Potential	Moderate	Low	Low
Potential Pathway	Soil, ground water, surface water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Open storage area; direct contact with soil and possibly ground water; near a drainage ditch	Blasting occurs in covered building; good primary containment; waste regularly transferred off-site	Roll-off containers appear to be in good condition; no signs of spills
Need for RFI	Yes	No	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 37	SWMU No. 38	SWMU No. 39
Unit Name	D&L Used Paint Can Dumpster	D&L Container Storage Area	Econo-Rail Container Storage Area
Description	Open-top, 30-cubic yard, roll-off container	Less-than-90-day container storage area	Container storage area for plastic salvage drums
Operating Status	Active since 1992	Active since 1992	Active since 1990
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Empty metal paint cans, which may contain paint residue	55-gallon drums containing paint waste and spent catalyzed and uncatalyzed solvents	Drums containing used oil filters and oily rags
Waste Management	D&L workers routinely place empty metal cans in the roll-off; waste is transferred off-site for disposal within 90 days	Drums filled with waste generated during daily on-site equipment cleaning; once a month, waste is transferred off site for incineration	Oil filters are replaced during repainting; oily rags and used oil filters are deposited in salvage drums; drums are periodically taken off-site for incineration of contents; drums are returned to site
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Roll-off containers appeared to be in good condition; no signs of spills	No signs of spills; drums in good condition	No signs of spills; drums in good condition; concrete pad in fair condition
Need for RFI	No	No	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 40	SWMU No. 41	SWMU No. 42
Unit Name	Westinghouse Container Storage Area	Texas Distribution Services Container Storage Area No. 1	Texas Distribution Services Container Storage Area No. 2
Description	Container storage area for unknown wastes	Container storage area for oil drilling products	Container storage area for expired oil drilling products
Operating Status	Active since 1988	Active since 1990	Active since 1990
Regulatory Status	Not permitted; subject to RCRA regulation	Not permitted; subject to RCRA regulation	Not permitted; subject to RCRA regulation
Waste Type	Drums containing waste oil, waste paint, waste chemicals, soapy rinsewater, trichloroethylene, and unknown substances	Open drums of unknown oil drilling products, including asphalt and coke products, a soap-like substance, and a brown material	Expired product used for drilling operations and one waste drum of "Akti-Flow S"
Waste Management	Waste generated during cleaning, refurbishing, and repairing of engines and other unknown processes	Area is used for storage of chemical products	Expired product is stored for an unspecified length of time before it is returned to the manufacturer; occasionally, the facility has shipped product off site for disposal on behalf of a client
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	Westinghouse plans to test drum contents and ship waste off site for disposal or recycling	None	None
Release Potential	Moderate	Moderate	Low
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Unknown wastes stored on concrete and dirt floor for several years without permit; drums in fair condition; no secondary containment	Open drums containing unknown product mixed with rainwater stored in this unit	Drums in good condition; no signs of spills
Need for RFI	Yes	Yes	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 43	SWMU No. 44	SWMU No. 45
Unit Name	Stolt-Nielsen Wastewater Tanks	Coastal Cargo Vehicle Repair Area	Non-hazardous Waste Pile
Description	Four tank units: three 584-gallon and one 833-gallon	Temporary vehicle repair area	Waste pile
Operating Status	Active since 1989	Operating for an unknown period	Operating for an unknown period
Regulatory Status	Not regulated under interim status	Not regulated under interim status	Not regulated under interim status
Waste Type	Wastewater containing small quantities of food residue, detergent, and deodorizers	Used oil, used hydraulic fluid, and used transmission fluid	Miscellaneous rubble
Waste Management	Wastewater is vacuumed into these tanks through rubber hoses after steam cleaning and washing with detergent and deodorizer; wastewater is then pumped through rubber hoses to a train car, which transports wastewater to an off-site treatment facility	Waste is collected in plastic and metal pails and basins, and is disposed off site	Miscellaneous rubble is stored in this area, with no scheduled plans for removal
Release History	None	None	None
Release Pathway	N/A	N/A	N/A
Remedial Action Taken	None	None	None
Release Potential	Low	Low	Low
Potential Pathway	Soil, ground water	Soil, ground water	Soil, ground water
Reason for Release Potential Rating	Tanks in good condition; secondary containment provided by two-foot berm	No signs of spills; concrete floor is intact	Area used solely to collect non-hazardous rubble containing no hazardous constituents
Need for RFI	No	No	No

**Table 7-1
SWMU Summary (Continued)**

Unit	SWMU No. 46
Unit Name	Various Solid Waste and Scrap Metal Dumpsters
Description	Dumpsters of varying size and type
Operating Status	Active for varying periods
Regulatory Status	Not regulated under interim status
Waste Type	Non-hazardous solid waste and scrap metal
Waste Management	Waste is collected, and dumpsters are periodically emptied by disposal contractors and scrap metal recyclers; waste is disposed or reprocessed off-site
Release History	None
Release Pathway	N/A
Remedial Action Taken	None
Release Potential	Low
Potential Pathway	Soil, ground water
Reason for Release Potential Rating	Units are intact; dumpsters used to collect non- hazardous solid waste
Need for RFI	No